IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Noriki Fukunishi et al.	Art Unit	: 3765
Serial No.	: 10/565,836	Examiner	: Robert H. Muromoto, Jr.
Filed	: January 25, 2006	Conf. No.	: 7651
Title	: FABRIC AND PRODUCTION PROCESS THEREOF		

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REPLY BRIEF

Pursuant to 37 C.F.R. § 41.41, Appellant responds to the Examiner's Answer as follows

Appellant has provided detailed arguments against the rejections set forth in the final office action dated December 17, 2008, in Appellant's Brief on Appeal. In this Reply Brief, Appellant only provides comments on the Examiner's arguments presented in the Answer.

Claims 1-2, 5-8, 11-17 and 21-25 are patentable over "Zebra" in view of the Background section of the present application

A. Appellant respectfully disagrees with the Examiner's Answer, which states that a "direct extrapolation of total fabric thickness can not be made from yarn linear density alone" (*see* Examiner's Answer at p. 8). Appellant respectfully submits that fabric thickness can be determined based on the yarn linear density. Each yarn in a fabric is composed of multiple filaments. The yarn linear density can be used to calculate the diameter (*i.e.*, thickness) of each filament, which then can be used to determine the total thickness of the fabric.

For example, in the reference cited by the Examiner, the "Zebra" fabric includes two kinds of yarn: "Silflora" for warp and "Microserge" for weft. Silflora is sold in Japan by the assignee of this application and has a linear mass-density of 30 denier (33 dtex) and includes 72 filaments. Microserge, as noted in the cited reference, has a linear mass-density of 37 denier (41 dtex) and includes 180 filaments. In general, yarns are formed of multiple layers of filaments formed on top of one another in which each layer includes 12 to 15 individual filaments arranged transversely along a row. Accordingly, if an average layer includes 13.5 filaments, then the

number of filament layers in the warp is based on the total number of filaments divided by the average number in each layer, *i.e.*:

Number of layers for warp = 72/13.5 = 5.3.

Similarly, the number of filament layers in the weft is:

Number of layers for weft = 180/13.5 = 13.3.

Given that the filaments are arranged transversely along a row in each layer, the thickness of each layer, and thus the total warp and weft thickness, can be determined if the thickness of each filament is known. To determine the individual filament thickness, the linear density for each filament is used to calculate the filament diameter. For example, in the case of Silflora, the linear density per filament is given by the yarn linear density divided by the number of filaments, *i.e.*:

Warp linear density per filament = 30 denier/72 filament = 0.4167 denier.

Given that a filament is a long cylinder, the linear density per filament can be expressed simply as the density (ρ) of the filament material multipled by the area of a circle. Silflora is formed using polyester filaments, in which polyester has a density of 1.38 g/cm^3. Accordingly, the radius, r, of a filament is given by:

$$r = [(\text{Linear density per filament}) * 1/(\rho) * 1/\pi]^{1/2}$$

Using the foregoing equation, the radius of a filament of Silflora in micrometers is 0.00327 mm. Given that the diameter of a filament is simply twice the radius, each filament has a thickness of about 0.00654 mm. Furthermore, the total thickness of all layers for the warp then is 5.3 * (0.00654 mm) = 0.0347 mm. Similar calculations can be performed for the weft, in which the filaments also are formed from polyester. Thus, the total thickness for the weft is about 0.0607 mm.

However, each filament layer is not piled neatly inside the fabric. Instead, each layer is piled above one another in a bended state for both warp and weft. It is known by those of

ordinary skill in the art that, in order to accommodate for this bending (*i.e.*, the "bending degree of a fabric"), the total warp and weft thickness must be multiplied by 2. Thus, combining the warp and weft thicknesses and multiplying by 2 due to the bending degree of a fabric gives a total "Zebra" fabric thickness of about 0.191 mm, which is significantly **greater than** the maximum claimed thickness of 0.07 mm. Even if the warp utilizes 36 filaments, instead of 72 as indicated in the foregoing example, the total "Zebra" fabric thickness is about 0.171 mm, which still is much **greater than** the maximum claimed thickness.

In contrast, the fabric disclosed in Example 1 of the present application utilizes a warp and weft each having a linear density of 18 denier (20 dtex) and 20 filaments, in which the filaments are formed from nylon having a density of 1.14 g/cm^3. Using the same calculation for fabric thickness described above, the total fabric thickness is calculated to be 0.063 mm, which is less than the maximum thickness claimed and comparable to the thickness (0.066 mm) of the fabric disclosed in Example 1 of the present application (*see* Specification at Table 1). In view of the foregoing, it is clear that the thickness of a fabric can be calculated based on linear density and that the cited reference discloses a fabric having a thickness **greater than** the maximum as recited in claims 1 and 17 of the present application.

As explained in Appellant's Appeal Brief, findings of inherency "can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product" (*see* MPEP § 2112.01, emphasis in original). Accordingly, given that the thickness of the "Zebra" fabric does not, and indeed cannot, "necessarily" have a thickness of "0.07 mm or less," the Examiner's finding of inherency is incorrect.

B. The Examiner's Answer further alleges that rip width is "without a doubt a measured property of the exact rip stop weaving design, i.e. distance between ripstop structures in the fabric" and thus corresponds to a property that can be presumed to be inherent (*see* Examiner's Answer at p. 8). Appellant respectfully disagrees and submits that the claimed lip widths are not inherent in the "Zebra" fabric. As explained in Appellant's Appeal Brief, Figures 1 and 2 of the present application demonstrate that two otherwise similar fabrics, which possess features within the scope of claim 1, have lip widths that *vary* by about 100% (*see* Specification at Table 1, "Rip

stop width."). If the lip widths of those fabrics were "directly related" to the other fabric properties, as alleged by the Examiner, then it would not make any sense that the lip widths should vary by such a large degree. Accordingly, there is no reason that the fabric of the Zebra reference, which has numerous structures and properties that *differ* from claim 1, necessarily has the claimed lip widths of 5 mm or less. Thus, the Examiner's finding of inherency with respect to the claimed lip width is incorrect.

Conclusion

For these reasons, and the reasons stated in the Appeal Brief, Appellant submits that the final rejections should be reversed.

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Respectfully submitted,

Date: 10.2.09

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